

Can cancer risk information raise awareness without increasing anxiety? A
randomized trial

Kathryn A Robb Ph.D¹, Anne Miles Ph.D¹, John Campbell M.D.², Philip Evans
M.B.³, Jane Wardle Ph.D¹

¹Cancer Research UK Health Behaviour Unit, Department of Epidemiology and
Public Health, University College London, Gower Street, London, WC1E 6BT, UK

²Peninsula Medical School, Exeter, Devon, EX2 5DW, UK

³St Leonard's Research Practice, 3 Barnfield Crescent, Exeter, EX1 1QT, Devon,
UK

Corresponding author: Kathryn Robb, Cancer Research UK Health Behaviour
Unit, Department of Epidemiology and Public Health, University College London,
Gower Street, London, WC1E 6BT, UK. Tel: +44 (0)20 7679 6642; Fax: +44
(0)20 7813 2848; Email: k.robb@ucl.ac.uk

Running head: Cancer risk information

Abstract word count=198

Main text word count=1202

Tables=1

Figure=1

ABSTRACT

Objective: Promoting public awareness of cancer risk factors is an important public health goal, but there is concern that it could heighten anxiety. This study examined the impact of mailed information about colorectal cancer on awareness of risk factors, emotional wellbeing, and interest in attending screening, in a population not previously exposed to screening.

Method: 3,185 individuals aged 45-66 years registered with general practitioners in South-West England in 2004 were randomized to: 1) control group (no information), 2) information on colorectal cancer risk factors, or 3) information on risk factors and colorectal screening. All participants were sent a questionnaire assessing knowledge, anxiety, worry about colorectal cancer, and interest in screening.

Results: 1,945 questionnaires (61%) were returned. As expected, participants receiving information had significantly greater knowledge than the control group. Anxiety scores were in the normal range and neither anxiety nor worry about cancer differed significantly between the groups. 93% of respondents indicated they would be interested in screening, with equally high levels across groups.

Conclusion: This study suggests that information leaflets can promote knowledge of cancer risk factors without increasing anxiety. Low-cost educational materials have the potential to contribute to public engagement with health promotion and disease prevention.

Keywords: cancer risk information; psychological wellbeing; colorectal cancer; cancer awareness

INTRODUCTION

Promoting public awareness of cancer risk factors was one of the key proposals in the UK NHS Cancer Plan (Department of Health, 2000), and other countries have similarly recognized the need to increase knowledge about cancer (World Health Organisation, 2004). However, because cancer is widely perceived as threatening, there is concern that dissemination of cancer-related information could heighten public anxiety about the disease (Entwistle & Watt, 1998).

Knowledge of colorectal cancer (CRC) is very limited in the UK (McCaffery et al., 2003), but this may be because colorectal screening has not been part of the UK National Screening Program (NSP). Raising public awareness of CRC risk factors is timely because colorectal screening will be included in the NSP for the first time in 2006.

The present study investigated the impact of mailed information on CRC risk factors on knowledge, anxiety, worry and screening intentions. We hypothesized that risk factor information alone might raise anxiety, but providing information on screening at the same time would allay adverse psychological effects as predicted by the Fear-drive Model (Hovland et al., 1953).

METHOD

Participants

Participants were aged 45-66 years (N=3,365) and registered with one of two General Practices in South-West England. None of the participants had been screened before because screening was not part of the UK NSP at the time of data collection. Doctors excluded anyone diagnosed with cancer or awaiting investigation, as well as 'vulnerable' participants (e.g. very ill, learning difficulties).

Procedure

Randomization was by household to one of three groups: 1) control group (no information leaflet); 2) information leaflet on risk factors for CRC; 3) information leaflet on risk factors plus information on colorectal screening tests.

Letters signed by the doctor invited participants to take part in the research study, and were accompanied by a questionnaire, an information leaflet to those randomized to receive it, and a freepost reply envelope. Ethical approval was obtained from the North and East Devon LREC.

The information leaflet

The four-page leaflet entitled 'Bowel cancer: The facts' was developed specifically for the study to be understandable even to poor readers (available from first author). The key messages were based on epidemiological evidence.

Participants randomized to receive information about screening were also given information on the fecal occult blood test and flexible sigmoidoscopy (FS).

Measures

As a manipulation check, participants were asked 'Have you read the leaflet 'Bowel Cancer: The facts?' (yes/no).

Age and gender were known from GP lists. Ethnicity and marital status were assessed with simple items (Table 1). Postcodes were used to index neighborhood-level deprivation (Townsend et al., 1988).

Knowledge of CRC was assessed with 10 statements about the risk of developing it (see Table 1) using a five-point response scale ('strongly disagree-strongly agree'). A total score was based on the number of correct responses.

The emotional impact of the intervention was assessed using the item 'How worried are you about getting bowel cancer?' ('Not worried at all/A bit worried/Quite worried/Very worried'), as used in the UK FS Trial (Wardle et al., 2000), and the short State Trait Anxiety Inventory (STAI; Marteau & Bekker, 1992).

Interest in screening was assessed with the item, 'If you were invited to have a bowel screening test, would you take up the offer?' ('Yes definitely/Yes, probably/Probably not/Definitely not') from the UK FS Trial (Wardle et al., 2000).

Statistical analysis

The intention-to-treat-principle was used so all participants in the information groups were included in the analyses regardless of whether they

indicated that they had read the leaflet to assess the likely impact of the leaflet as a public-health tool.

RESULTS

Questionnaires were returned by 61% (Figure 1). Respondents ($M=55.0$ years) were slightly older ($M=54.4$ years; $t(3183)=2.90$, $p<0.01$), more likely to be female (52.2% vs. 47.8%, $\chi^2(2,N=3185)=29.32$, $p<0.01$) and came from less deprived neighborhoods (Townsend scores $M=-1.44$ ($SD=2.58$) vs. $M=0.97$ ($SD=2.73$); $t(3102)=-4.79$, $p<0.01$) than non-respondents.

[Figure 1]

There were no differences in response rates across the groups, nor any differences in demographic characteristics (Table 1).

The majority (67%) of respondents in the risk factor information group indicated that they had read the leaflet, compared with 72% in the risk factor and screening group (Figure 1), but this difference was not significant.

[Table 1]

For every statement about CRC, participants in the information groups had significantly greater knowledge than the control group (Table 1), with no significant differences between the two information groups. Total knowledge scores were significantly higher in the information groups than the control group.

Internal reliability of the STAI was high (Cronbach's $\alpha=0.8$). There was no significant difference in anxiety across the three groups (Table 1). Worry was analyzed in 3 categories because there were too few counts in the 'very worried' category. Worry did not differ significantly across the three groups. Interest in screening was the same across the three groups (Table 1).

Re-analysis of all outcomes accounting for household clustering of response suggested this was of no importance in determining the pattern results.

DISCUSSION

Respondents receiving the information leaflet had significantly greater knowledge about the risk factors for CRC, but were no more anxious or worried about CRC than the control group, contrary to the fears of some health

professionals (Entwistle & Watt, 1998). Indeed, levels of anxiety across all three groups were slightly lower than observed in previous studies (Marteau & Bekker, 1992). Presenting cancer risk factor information with or without screening information did not differentially impact on any of the outcome variables.

Interest in colorectal screening was high across all three groups. If this were translated into attendance, it bodes well for the introduction of screening in the UK.

There are limitations to the study. We used a between-subjects design, where a within-subjects design would have ensured that any changes were purely the result of the intervention. However, as there were no significant differences across the groups in demographic characteristics, this suggests that randomization successfully eliminated chance differences. The Townsend Deprivation scores showed that respondents were more affluent than the national average (zero), and it is likely that they represent a more health-literate group, so the results cannot be generalised to the full population. We only assessed the short-term impact of the information and it is not possible to judge the longer-term impact. The knowledge measure was limited because all the statements could be correctly answered in the affirmative, but this was because our pilot studies showed that negatively phrased items made it less understandable. The worry measure was also limited by being a single-item measure, but it has been used successfully before (Wardle et al., 2000). The response rate was 61% which is comparable to other primary care surveys (Walsh, 1994), but of course that leaves a substantial minority of people whose reaction to the risk information is unknown. Finally, it was not possible to ascertain the impact of the information leaflet on visits to GPs with concerns about CRC, but this could be addressed in future work.

These encouraging findings suggest that it is possible to increase public awareness of risk factors for cancer - using relatively simple, low-cost materials - without increasing anxiety among this sample. Materials such as these could contribute to the public 'engagement' with health-promotion and disease-

prevention called for to achieve advances in population health in the 21st century (Wanless, 2002).

ACKNOWLEDGMENTS

We thank Manjo Doug, Christine Pike and the doctors, staff and patients at St Leonard's Research Practice and Ide Lane Surgery, Exeter. This work was supported by the Medical Research Council and Cancer Research UK, but all work was initiated and analyzed by the investigators.

Conflict of interest: None

REFERENCES

Department of Health, 2000. The NHS Cancer Plan: A plan for investment a plan for reform. London, Crown Copyright.

Entwistle, V. A. & Watt, I. S., 1998. Disseminating information about healthcare effectiveness: a survey of consumer health information services. *Qual. Health Care*, 7, 124-129.

Hovland, C. I., Janis, I. L., & Kelley, H. H., 1953. Fear-arousing Appeals. In C.I.Hovland, I. L. Janis, & H. H. Kelley (Eds.), *Communication and Persuasion: Psychological Studies of Opinion Change* (pp. 56-98). New Haven, Yale University Press.

Marteau, T. M. & Bekker, H., 1992. The development of a six-item short-form of the state scale of the Spielberger State-Trait Anxiety Inventory (STAI). *Br.J Clin Psychol.* 31, 301-306.

McCaffery, K., Wardle, J., & Waller, J. 2003., Knowledge, attitudes, and behavioral intentions in relation to the early detection of colorectal cancer in the United Kingdom. *Prev.Med.* 36, 525-535.

Townsend, P., Phillimore, P., & Beattie, A. (1988). *Health and Deprivation: Inequality and the North*. Kent, Croom Helm.

Walsh, K., 1994. Evaluation of the use of general practice age-sex registers in epidemiological research. *Br.J.Gen.Pract.* 44, 118-122.

Wanless, D., 2002. *The Wanless Report:Securing our Future Health - Taking a Long-Term View* HM Treasury.

Wardle, J., Sutton, S., Williamson, S., Taylor, T., McCaffery, K., Cuzick, J. et al., 2000. Psychosocial influences on older adults' interest in participating in bowel cancer screening. *Prev.Med.* 31, 323-334.

World Health Organisation, 2004. Strategies to improve and strengthen cancer control programmes in Europe. Report of a WHO consultation. Geneva, WHO.

Figure 1

Trial profile (South-West England, 2004)

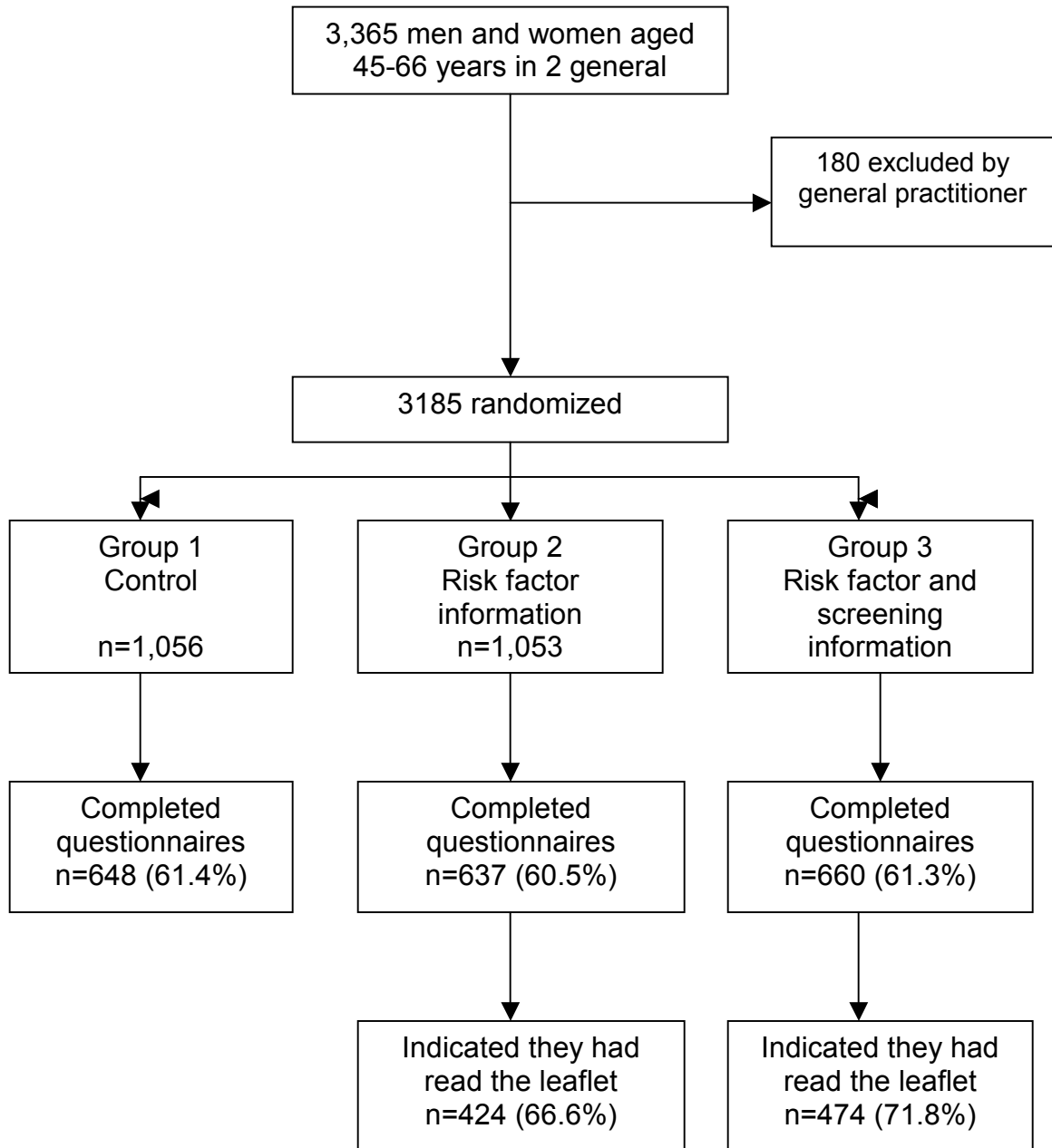


Table 1

Demographic characteristics, knowledge and emotional impact across the 3 groups of respondents (South-West England, 2004). Values are numbers (percentages) unless stated otherwise

	Control n=648	Risk factor information n=637	Risk factor and screening information n=660	Significance
Demographic characteristics				
Gender				
Female	345 (53.2)	314 (49.3)	356 (53.9)	$\chi^2(4, N=1945)=3.24, p=0.20$
Male	303 (46.8)	323 (50.7)	304 (46.1)	
Age Mean (SD)	54.8 (5.8)	54.8 (5.9)	55.4 (5.7)	$F(2, 1944)=2.54, p=0.08$
Ethnicity				
White	630 (98.0)	623 (98.9)	630 (98.3)	$\chi^2(4, N=1914)=1.71, p=0.42$
Non-white	13 (2.0)	7 (1.1)	11 (1.7)	
Marital status				
Married	440 (68.4)	440 (69.7)	453 (70.3)	$\chi^2(8, N=1918)=4.26, p=0.83$
Cohabiting	51 (7.9)	50 (7.9)	53 (8.2)	
Divorced/separated	82 (12.8)	78 (12.4)	79 (12.3)	
Widowed	17 (2.6)	22 (3.5)	22 (3.4)	
Single	53 (8.2)	41 (6.5)	37 (5.7)	
Townsend score Mean (SD)	-1.44 (2.56)	-1.38 (2.73)	-1.49 (2.46)	$F(2, 1886)=0.32, p=0.72$
Knowledge				
% aware of each risk factor				
Inactivity	270 (42.2)	504 (79.2)	508 (77.7)	$\chi^2(4, N=1930)=253.58, p<0.01$
Diet high in red meat	290 (45.0)	550 (86.8)	543 (83.0)	$\chi^2(4, N=1932)=341.34, p<0.01$
Smoking	277 (43.2)	538 (84.7)	543 (83.3)	$\chi^2(4, N=1929)=344.37, p<0.01$
Being overweight	313 (48.5)	546 (86.0)	549 (84.1)	$\chi^2(4, N=1933)=294.61, p<0.01$
Increasing age	349 (54.4)	558 (87.7)	551 (85.2)	$\chi^2(4, N=1925)=241.67, p<0.01$
Being male	133 (20.7)	510 (80.2)	509 (78.0)	$\chi^2(4, N=1931)=606.93, p<0.01$
% aware of risk even if no family history	550 (85.4)	599 (94.2)	604 (92.8)	$\chi^2(4, N=1931)=34.81, p<0.01$
% aware of risk	405 (62.9)	572 (89.9)	567 (86.8)	$\chi^2(4, N=1933)=177.04,$

even if no
symptoms

$p < 0.01$

Table 1 continued

	Control n=648	Risk factor information n=637	Risk factor and screening information n=660	Significance
% aware bowel cancer develops from polyps	254 (39.5)	518 (81.7)	537 (82.7)	$\chi^2(4, N=1926)=360.00, p<0.01$
% believe can control whether get bowel cancer	365 (56.9)	464 (73.3)	466 (71.3)	$\chi^2(4, N=1928)=51.36, p<0.01$
Total knowledge score	4.95 (2.56)	8.41 (2.28)	8.15 (2.60)	$F(2, 1944)=388.63, p<0.01$
Emotional impact				
STAI anxiety mean (SD)	10.66 (3.79)	10.58 (3.66)	10.78 (3.83)	$F(2, 1931)=0.47, p=0.63$
Bowel cancer worry				
Not at all	241 (37.8)	235 (37.4)	224 (34.8)	
A bit worried	341 (53.4)	326 (51.9)	349 (54.2)	
Quite/very worried	56 (8.8)	67 (10.7)	71 (11.0)	$\chi^2(4, N=1910)=3.09, p=0.54$
Screening interest				
Interest in bowel screening				
Yes definitely	407 (63.0)	395 (62.8)	415 (64.0)	
Yes probably	197 (30.5)	184 (29.2)	185 (28.6)	
Probably not	35 (5.4)	46 (7.3)	39 (6.0)	
Definitely not	7 (1.1)	4 (0.6)	9 (1.4)	$\chi^2(4, N=1926)=4.19, p=0.65$